

ASTRONOMY

Summer Stars Are Shining

Typical Is Scorpius, the Scorpion, With Red Antares And Hook-Shaped Tail; Occultation Is Interesting

By JAMES STOKLEY

MOST characteristic of the summer constellations, which are now in the evening sky, is Scorpius, the scorpion, seen low in the south. The maps show its position for 10:00 p. m., Eastern Standard Time, at the first of July and for 9:00 p. m., on the 15th. Antares, red in color, is the most prominent star in this group, but others are easily identified. A hook-shaped row that curls down and to the left forms the tail, while the stars in the vertical row to the right make up the claws. Immediately to the left of the tail is a group outlining a teapot, part of another familiar summer figure, Sagittarius, the archer.

Some of the other bright stars now seen can be found conveniently from the Great Dipper, which appears to the northwest, hanging downwards from the handle. Alkaid is the top star, and the two bottom ones, Merak and Dubhe, are the pointers. A line from them to the right indicates the pole star. By following the curve of the dipper's handle from Alkaid, one comes to Arcturus, in Bootes, the bear-driver, and then to Spica, in Virgo, the virgin.

In addition to Arcturus, Spica and Antares, there are three other first magnitude stars now in the sky, all to the east. Nearly overhead is Vega, of Lyra, the lyre. As this is the brightest star in the summer evening sky, it is easy to find. Below it is a figure shaped like a cross on the side. This is Cygnus, the swan, and the bright star at the northern end of the cross is Deneb. About as high, and farther south, is a bright star attended by a fainter one above and below. The bright one is Altair, and it forms part of Aquila, the eagle.

For most of the month only two planets are to be seen during the evening. They will be easy to locate, because of their brilliance which is much greater than any of the stars. Low in the west, in Leo, the lion, is Venus, brighter of the two. Jupiter, somewhat fainter, appears in the east, in Aquarius, the water carrier, soon after sunset. At the end of the month, these will be joined

briefly by a third planet, Mercury. On the last day it will be farthest east of the sun, and then will set a little more than an hour after sunset. For a day or two before this it might be glimpsed low in the west, below Venus. It will then be brighter than Altair, though not so bright as Vega or Arcturus.

Saturn rises this month, in the constellation of Pisces, the fishes, soon after the middle of the night. Mars, only remaining naked eye planet, is not visible at all. It is too close to the sun, with which it is almost in line on July 24.

Though this month brings no eclipses, it does bring, during evening hours, a star occultation which can be observed with small instruments, such as a good pair of binoculars. If you have access to a small telescope, like those used at the seashore or in the mountains, it will be an even better aid.

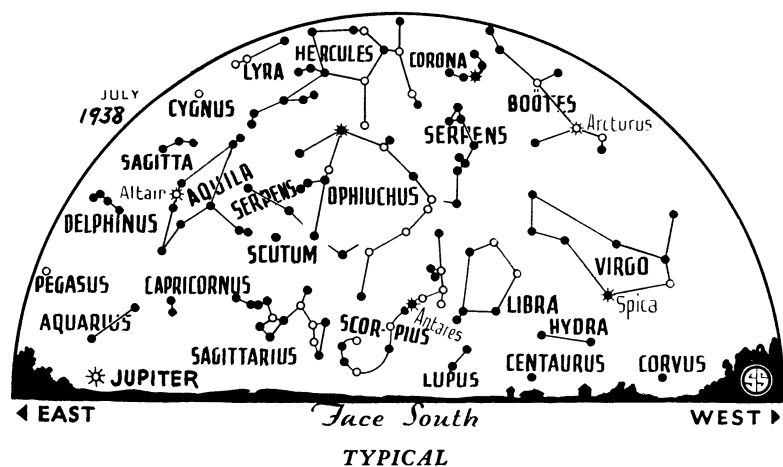
On July 11, the moon, a day before it is full and hence very brilliant, passes in front of the star mu Sagittarii, one of the fourth magnitude in the constellation of Sagittarius. At Washington, the star disappears behind the moon at 10:31 p. m., Eastern Standard Time, and emerges at 12:02 a. m. As the moon moves around the sky from west to east the occultation will occur earlier in the

western part of the country. In California, in fact, it occurs before sunset, so will not be visible, but in the central states it vanishes about 9:00 p. m., Central Standard Time, and emerges about an hour and a half later.

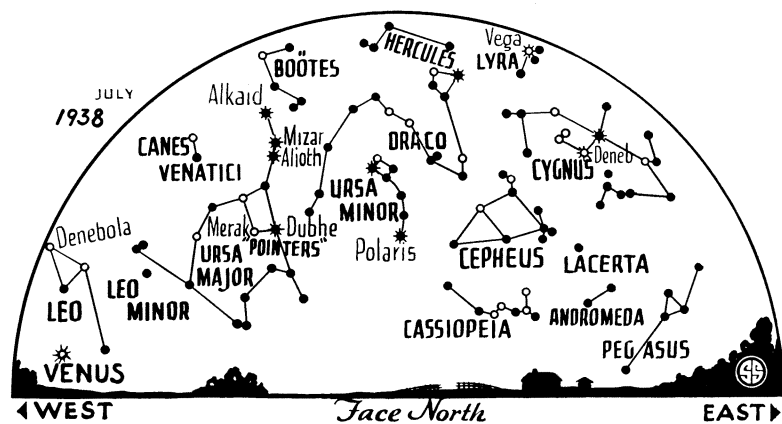
Though this time of year is usually associated with warm weather, it is actually the time when the sun is most distant. On July 2, the earth is in aphelion, that is, farthest from the sun, with a distance of 94,452,000 miles. Thus it is more than three million miles farther than last January 3, when it came to within 91,345,000 miles. The greater distance of the sun in July tends to make its heating effect less than in January but, for us in the northern hemisphere, it is much higher during the day than it was at the start of the winter. This means that its rays are more concentrated, and this much more than compensates for the loss due to the added few million miles over which its rays have to travel.

Of all heavenly bodies, the sun is by far the most important to us earth-dwellers, for all our power, whether from water, from wood, from coal, or anything else, comes ultimately from it. But it is important to astronomers for another reason. The sun is a star, a glowing globe of gas, similar to Vega, Arcturus and others. But they, like all the stars in the night-time sky, are so remote that even through the greatest

☼ * ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS



The Scorpion with its hooked tail shines in the southern skies of July.



TWO PLANETS

Venus, the brighter, shines low in the west. Jupiter is in the east.

of telescopes they appear as mere points of light. Fortunately, the sun is fairly typical and relatively close, so that some of the details of its structure can be observed. These help us to appreciate what is happening in the distant suns.

The most easily observed features of the sun are the spots, which are really enormous whirlwinds in its atmosphere often a hundred thousand miles or more in length. Because they are whirling so rapidly, the gases of a spot are expanding, and, hence are much cooler than the surrounding gases. The cooling is from about 11,000 to 7,500 degrees Fahrenheit, which is far more than anything that can be accomplished by man-made refrigerators.

Sunspots vary over a cycle of approximately 11 years. About 1933, months passed without a spot appearing. Now they are almost always present, for we are nearly at the time of their maximum number. All sorts of terrestrial effects have been credited with variation in step with the sunspots. Some of these correlations are doubtful, but at least there are more displays of the north-

ern lights when they are present. The sunspots shoot electrified particles to the earth, which are drawn in by our magnetic field. As these particles penetrate the rarefied gases in the upper atmosphere, they cause a glowing, something analogous to that of the neon advertising signs that add their ruddy light to our city streets. With sunspots numerous, this summer is likely to see some good displays of the northern lights, or aurora borealis, as they are correctly called. The farther north one is, the more likely they are to be seen, but brilliant displays have appeared as far south as Texas, so any part of the United States has a chance of seeing them.

Phases of the Moon

		E. S. T.
First quarter	July 4	8:47 a. m.
Full moon	July 12	10:04 a. m.
Last quarter	July 20	7:19 a. m.
New moon	July 26	10:54 p. m.
Apogee	July 11	4:00 p. m.
Distance—	252,500 miles.	
Perigee	July 26	6:00 a. m.
Distance—	222,500 miles.	

Science News Letter, June 25, 1938

with astonishment of the scientific collaboration of the Rockefeller Institute experimenter and the aviator. Lindbergh had developed a pump that perfused or bathed whole organisms from the animal body with life maintaining liquids. Dr. Carrel carried on the exceedingly careful experiments that promise to help in the solution of an endless number of problems in normal bodily function and disease.

Now in order that others may apply their methods they have published a book of details, the Culture of Organs (Hoeber).

Dr. Carrel sees the day when human organs will manufacture in the Lindbergh pump the protective and curative substances supplied today to patients by horses and rabbits.

He dreams of removing diseased portions of the body and sending them to large Lindbergh pumps as patients are now sent to the hospital. A kidney removed for tuberculosis or a leg amputated by osteosarcoma would possibly heal under the influence of an artificial medium in the glass organ hospital. He believes that replanting the portion of the body would offer no difficulty, as surgical techniques for the suture of blood vessels and the transplantation of organs and limbs were developed long ago.

Regeneration of organs within the body is foreseen. Cultivation of the organs in the Lindbergh pump would allow the discovery of the nature of the specific chemicals demanded by these organs for growth and normal function. Then it would be possible to feed these chemicals to the body, renewing the damaged gland, instead of continuing to supply the hormone by injection. To bring about the regeneration within the pancreas of the Langerhans' islands would be a far more efficient method of treating diabetes than to inject insulin daily into the body of the patient.

Science News Letter, June 25, 1938

MEDICINE

Lindbergh and Carrel Foresee Removal of Organs For Cure

EXPERIMENTS upon living parts of the human body after personality has vanished; manufacture by human organs in vitro of hormones and antibodies needed in the cure of disease; removal of diseased organs from the body, their cure in the Lindbergh pump and their replanting in the human body.

These are some of the wonders of medicine that Dr. Alexis Carrel and Col. Charles A. Lindbergh consider possible for the future as the result of the development of the Lindbergh pump and the surgical and chemical procedures for the cultivation of organism.

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